

PATENT ABSTRACTS OF JAPAN

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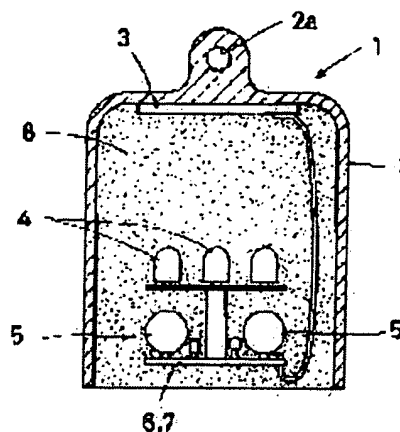
(72)Inventor : TSUSHIMA TOMOHIKO

(54) LIGHTED MARKER

(57)Abstract:

PURPOSE: To obtain sufficient weather resistance by simple structure without requiring a power distribution facility.

CONSTITUTION: In a lighted marker 1, a solar cell 3, each light-emitting diode 4, batteries 5, a charging circuit 6 and a light-emitting circuit 7 are arranged inside a synthetic-resin transparent case 2, and the inside of the case 2 is filled with a transparent epoxy resin 8. The power of the solar cell 3 is applied to the charging circuit 6, and the batteries 5 are charged by the charging circuit 6. The light-emitting circuit 7 monitors an output from the solar cell 3, and the voltage of the batteries 5 is applied intermittently to each light-emitting diode 4 when the output from the solar cell 3 is made lower than a predetermined level, when night comes. Accordingly, each light-emitting diode 4 intermittently emits light.



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CLAIMS

[Claim(s)]

[Claim 1] Luminescence indicator equipment which embeds a solar battery, a light emitting device, the battery that accumulates the power generated by this solar battery, and the luminescence circuit which the power of this battery is applied [circuit] to this light emitting device, and makes this light emitting device emit light when the power of this solar battery declines at a transparent synthetic-resin nature base material, and comes to enclose it.

[Claim 2] Luminescence indicator equipment according to claim 1 which mixed in the transparent synthetic-resin nature base material the optical dispersing agent of minute and transparent a large number which have a different optical refractive index from this synthetic-resin nature base material.

[Claim 3] Luminescence indicator equipment which embeds and encloses with a synthetic-resin nature base material transparent at least a light emitting device and the luminescence circuit which makes this light emitting device emit light, and comes to mix in this synthetic-resin nature base material the optical dispersing agent of minute and transparent a large number which have a different optical refractive index from this synthetic-resin nature base material.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is arranged around a construction site and relates to the luminescence indicator equipment used for position representation at night.

[0002]

[Description of the Prior Art] In the construction site, the hazard area, etc., the indicator which emits light is arranged as everyone knows, and the general public enables it to identify even if it is night.

[0003] As this kind of an indicator, while forming a reflecting plate, for example behind an electric light, there are some which formed the glass plate of coloring or the transparence plastic sheet of coloring ahead [of an electric light]. The irregularity of the shape of a lens with the small transparence plate of this coloring is formed in the whole surface, and, thereby, the whole surface of a transparence plate emitted light uniformly.

[0004]

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional indicator, although lens-like irregularity was formed all over the transparence plate of coloring, it was not necessarily able to be said that the whole surface was emitting light uniformly.

[0005] Moreover, although weatherability was required since such an indicator was installed out in the fields and it was exposed to the rainstorm, there is nothing that has weatherability sufficient with easy structure, and such a thing was desired.

[0006] Furthermore, since the power distribution facility was needed in the case of such an indicator, the initial cost was high, and power distribution work etc. was troublesome, and it was not able to use on the heart of the mountains or the seashore which do not have a power distribution facility further.

[0007] Then, the technical problem of this invention does not need a power distribution facility, but is to obtain the luminescence indicator equipment which has sufficient weatherability with easy structure.

[0008]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, when the power of a solar battery, a light emitting device, the battery that accumulates the power generated by this solar battery, and this solar battery declines, the luminescence indicator equipment of this invention applies the power of this battery to this light emitting device, embeds the luminescence circuit which makes this light emitting device emit light at a transparent synthetic-resin nature base material, and comes to enclose it.

[0009]

[Function] The power generated by the solar battery is charged at the battery, and when the power of this solar battery declines, a luminescence circuit applies the power of this battery to this light emitting device, and is making this light emitting device emit light with the luminescence indicator equipment of this invention. For this reason, charge of a solar battery will be performed, and a light emitting device will not emit light at day ranges, but a light emitting device will emit light at night. Moreover, since the solar battery, the light emitting device, the battery, and the luminescence circuit are embedded and enclosed with the transparent synthetic-resin nature base material, sufficient weatherability is obtained.

[0010]

[Example] Hereafter, the example of this invention is explained with reference to an accompanying drawing.

[0011] One example of the luminescence indicator equipment of this invention is shown in drawing 1 thru/or drawing 3 . Drawing 1 shows the appearance of the luminescence indicator equipment of this example, drawing 2 shows the cross-section structure of the equipment of this example, and drawing 3 shows the circuitry of the equipment of this example.

[0012] With this luminescence indicator equipment 1, a solar battery 3, each light emitting diode 4, the battery 5,

the charge circuit 6, and the luminescence circuit 7 are arranged inside the transparence case 2 of synthetic-resin nature. Opening of the soffit of this transparence case 2 is carried out, and it is filled up with the transparent epoxy resin 8 from this opening. Thereby, the contents of this transparence case 2 are enclosed. Moreover, hanging hole 2a is formed in the transparence case 2 upside.

[0013] A solar battery 3 receives sunlight through the wall of the transparence case 2, and generates power. This power is applied to a charge circuit 6, and a battery 5 is charged by this charge circuit 6. The luminescence circuit 7 is supervising the output of a solar battery 3, and if it falls rather than the level as which the output of this solar battery 3 was determined beforehand (i.e., if it becomes night), it will apply the electrical potential difference of a battery 5 to each light emitting diode 4 intermittently. Thereby, each light emitting diode 4 emits light intermittently.

[0014] Therefore, charge of a solar battery 3 is performed, and each light emitting diode 4 does not emit light at day ranges, but each light emitting diode 4 emits light at night.

[0015] The fine particles of synthetic amorphous silica are mixed in the epoxy resin 8. By this synthetic amorphous silica, the light of each light emitting diode 4 diffuses in an epoxy resin 8. For this reason, this whole luminescence indicator equipment 1 emits light without spots uniformly.

[0016] Moreover, this luminescence indicator equipment 1 emits light with the luminescent color of each light emitting diode 4.

[0017] With this luminescence indicator equipment 1, since a solar battery 3, each light emitting diode 4, the battery 5, the charge circuit 6, and the luminescence circuit 7 are enclosed into an epoxy resin 8, sufficient weatherability is obtained. For example, since seawater does not permeate to the contents of the transparence case 2 even if it attaches this luminescence indicator equipment 1 in the buoy which floats at sea, that weatherability is expectable. For the installation to this buoy, hanging hole 2a of the transparence case 2 lets the rope 11 as shown in drawing 1 pass, and it is connected to it. This rope 11 is drawn from a buoy and this luminescence indicator equipment 1 hangs down in the outer wall of a buoy. Of course, it is necessary to attach this luminescence indicator equipment 1 so that the solar battery 3 of this luminescence indicator equipment 1 may turn to an upside.

[0018] In addition, this luminescence indicator equipment 1 may be attached not only in a buoy but in other parts. For example, there is application to the rope stretched at sea, a network or the construction site in the ground, etc.

[0019] By the way, the luminescence indicator equipment of this invention is not limited to the thing of the above-mentioned example, but various deformation is possible for it.

[0020] For example, there is luminescence indicator equipment [as] 12 shown in drawing 4 . With this luminescence indicator equipment 12, the two-step case 13 is applied instead of the transparence case 2 of drawing 1 . That head 13a of this two-step case 13 is transparent, it is formed in the shape of a semi-sphere, and the solar battery 3 is arranged here. Moreover, drum section 13b of the two-step case 13 has a path smaller than head 13a, and this drum section 13a is inserted in opening of the upper bed of the stanchion 14 of the guard rail along a route.

[0021] Luminescence indicator equipment 15 is shown also in drawing 5 as the same modification as abbreviation. These luminescence indicator equipment 15 differs in the configuration of head 16a of the two-step case 16 as compared with the luminescence indicator equipment 12 of drawing 4 .

[0022] Luminescence indicator equipment 17 is shown in drawing 6 as another modification. With this luminescence indicator equipment 17, the left end of a case 18 is formed as cut aslant, and the right end of this case 18 is formed spherically. A solar battery 3 is arranged in the cutting plane across this case 18, and light emitting diode is arranged at the spherical part of this case 18. Moreover, fixing metal 19 is being fixed to the left end of this case 18. A stanchion 21 is inserted, it puts between each nut 22 of the upper and lower sides of these metallic ornaments 19, and these metallic ornaments 19 are fixed to the hole of this fixing metal 19. Thereby, this luminescence indicator equipment 17 is fixed. This luminescence indicator equipment 17 as well as the equipment of drawing 5 and drawing 6 is arranged in along a route.

[0023] Luminescence indicator equipment 23 is shown in drawing 7 as a modification of further others. With this luminescence indicator equipment 23, the left end of a case 24 is formed spherically and light emitting diode 4 is arranged in this. Moreover, a support plate 25 is fixed to the right end of a case 24, and the solar battery 3 is being fixed to this support plate 25. Furthermore, at the right end of a case 24, fixing metal 26 is fixed ***** . A stanchion 27 is inserted, it puts between each nut 28 of the upper and lower sides of these metallic ornaments 26, and these metallic ornaments 26 are fixed to the hole of this fixing metal 26. Moreover, the back up plate 29 and the support plate 25 of a solar battery 3 are piled up and fixed to the upper bed of a stanchion 27.

[0024] Drawing 6 and each luminescence indicator equipments 17 and 23 of drawing 7 are arranged in along a

route like the thing of drawing 4 and drawing 5 . The main points of difference of these luminescence indicator equipments 17 and 23 are the sense of a solar battery 3 and light emitting diode 4. That is, both are suitable towards reverse, and a solar battery 3 is the left sense, light emitting diode 4 is the right sense, and it is [a solar battery 3 and light emitting diode 4 are left sense, and] suitable [light emitting diode] with both the luminescence indicator equipments 23 of drawing 7 , in the same direction with the luminescence indicator equipment 17 of drawing 6 . This is because it is necessary to turn a solar battery 3 in the direction of solar and the direction of this sun and the direction of radiation of the light of light emitting diode 4 are not necessarily in agreement.

[0025]

[Effect] It has the solar battery and the light emitting device, a solar battery is charged at day ranges, and the light emitting device is made to emit light with the luminescence indicator equipment of this invention at night, as explained above. For this reason, a power distribution facility is not needed, but an initial cost is low, ends and can arrange easily in any locations.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention is arranged around a construction site and relates to the luminescence indicator equipment used for position representation at night.

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PRIOR ART

[Description of the Prior Art] In the construction site, the hazard area, etc., the indicator which emits light is arranged as everyone knows, and the general public enables it to identify even if it is night.

[0003] As this kind of an indicator, while forming a reflecting plate, for example behind an electric light, there are some which formed the glass plate of coloring or the transparence plastic sheet of coloring ahead [of an electric light]. The irregularity of the shape of a lens with the small transparence plate of this coloring is formed in the whole surface, and, thereby, the whole surface of a transparence plate emitted light uniformly.

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional indicator, although lens-like irregularity was formed all over the transparence plate of coloring, it was not necessarily able to be said that the whole surface was emitting light uniformly.

[0005] Moreover, although weatherability was required since such an indicator was installed out in the fields and it was exposed to the rainstorm, there is nothing that has weatherability sufficient with easy structure, and such a thing was desired.

[0006] Furthermore, since the power distribution facility was needed in the case of such an indicator, the initial cost was high, and power distribution work etc. was troublesome, and it was not able to use on the heart of the mountains or the seashore which do not have a power distribution facility further.

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, when the power of a solar battery, a light emitting device, the battery that accumulates the power generated by this solar battery, and this solar battery declines, the luminescence indicator equipment of this invention applies the power of this battery to this light emitting device, embeds the luminescence circuit which makes this light emitting device emit light at a transparent synthetic-resin nature base material, and comes to enclose it.

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OPERATION

[Function] The power generated by the solar battery is charged at the battery, and when the power of this solar battery declines, a luminescence circuit applies the power of this battery to this light emitting device, and is making this light emitting device emit light with the luminescence indicator equipment of this invention. For this reason, charge of a solar battery will be performed, and a light emitting device will not emit light at day ranges, but a light emitting device will emit light at night. Moreover, since the solar battery, the light emitting device, the battery, and the luminescence circuit are embedded and enclosed with the transparent synthetic-resin nature base material, sufficient weatherability is obtained.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view showing one example of the luminescence indicator equipment of this invention

[Drawing 2] The sectional view showing the structure of the equipment of this example

[Drawing 3] The block diagram showing the configuration of the equipment of this example

[Drawing 4] Drawing showing the modification of the luminescence indicator equipment of this invention

[Drawing 5] Drawing showing other modifications of the luminescence indicator equipment of this invention

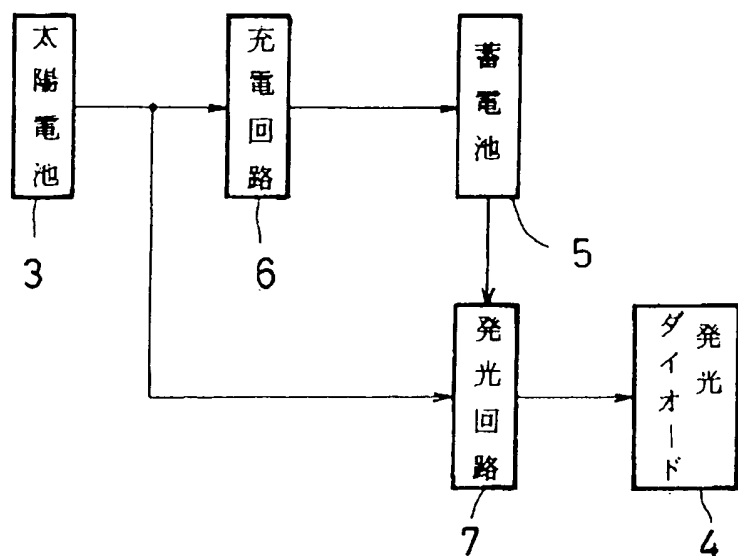
[Drawing 6] Drawing showing another modification of the luminescence indicator equipment of this invention

[Drawing 7] Drawing showing the modification of further others of the luminescence indicator equipment of this invention

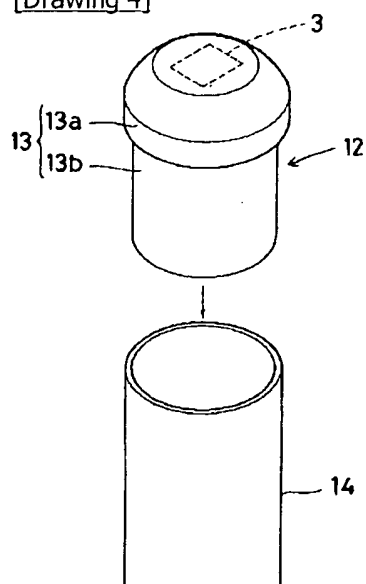
[Description of Notations]

- 1 Luminescence Indicator Equipment
- 2 Transparence Case
- 3 Solar Battery
- 4 Light Emitting Diode
- 5 Battery
- 6 Charge Circuit
- 7 Luminescence Circuit
- 8 Epoxy Resin

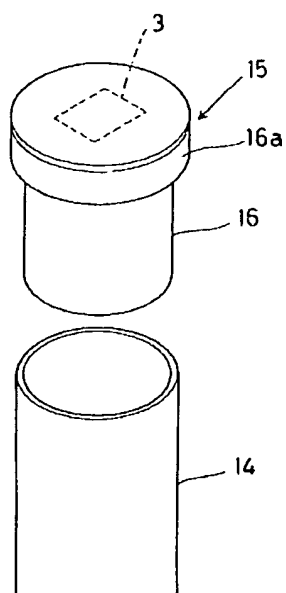
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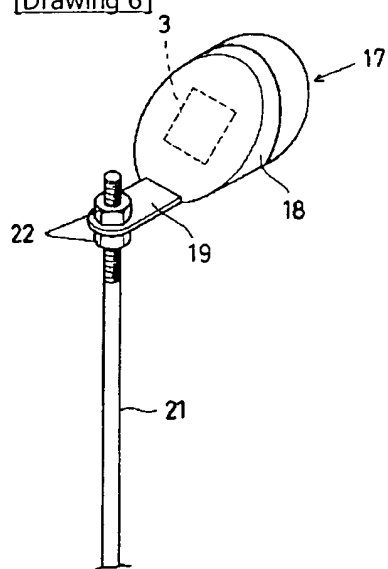
[Drawing 4]



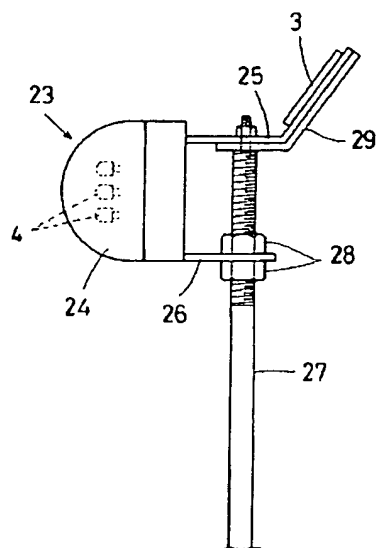
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]